

### **SAMPLING METHODS**

There are two types of sampling discussed in this Section: (1) systematic and (2) nonsystematic (nonstatistical or risk-focused). Both types of sampling should be used in the examination process. An example of systematic sampling is numerical interval sampling. Examples of nonsystematic techniques are minimum dollar cut-off and judgmental sampling.

In general, examiners should use systematic sampling methodologies for homogeneous assets and for testing the reliability of an institution's IAR program for nonhomogeneous assets (for the purpose of including the results of the IAR program in meeting minimum examination sampling coverage standards). If these samples raise concerns, or if a review of the assets selected suggest that major subcategories of assets were not included, the examiner should expand the sample using nonstatistical, risk-focused selection criteria.

More than one sampling technique is often needed when sampling nonhomogeneous assets. Usually, the examiner will select a systematic sample—such as a numerical interval sample—and then select an additional judgmental sample of potential problem assets that were not selected in the systematic sample.

Once a sample is selected, examiners must evaluate the possible risk of loss and the depth of review needed for each asset. A full review of each asset is not necessary merely because the asset has been included in the sample.

Each individual asset review must only be thorough enough to determine the particular attribute for which an examiner is testing. When an examiner is reviewing the reliability of the IAR program for purposes of including the results of the IAR program in meeting minimum examination sampling coverage standards, the asset review should focus on whether the institution's classification coincides with the examiner's classification (e.g., whether there are exceptions in the institution's internal classifications). When examiners review underwriting practices, their asset review should be of sufficient depth to ascertain the institution's application of prudent underwriting standards.

For example, a well-secured and performing loan presents a low risk of loss and usually should be analyzed only to determine the adequacy of cash flows, the borrower's capacity, the perfection of liens, and the reliability of appraisals. In contrast, loans that are nonamortizing, nonperforming, or without adequately controlled collateral present substantially more risk and require in-depth analysis to determine proper classification.

The following are descriptions of the different sampling methodologies to be used to ascertain the reliability of the IAR program (so that its results can be used to meet minimum examination sampling coverage standards for nonhomogeneous assets) and used for the evaluation of the institution's use of prudent underwriting standards (for both homogeneous and nonhomogeneous assets).

For each of these sampling techniques, the thrift's assets must be divided into pools that are similar in terms of the attribute for which the examiner is sampling. In general, homogeneous assets will be divided into just two pools, one- to four-family residential real estate loans and consumer loans. The use of additional pools may be considered if the institution uses significantly different procedures for a particular group of loans. The definition of significantly different procedures would include such criteria as the use of separate underwriting guidelines, the establishment of separate and distinct loan departments or any other characteristic that substantially differentiates a particular group of loans from the general population.

When reviewing the IAR program for nonhomogeneous assets, the examiner need not divide the IAR program-reviewed assets into separate pools. All assets reviewed under an institution's IAR program should be treated as a single pool for sampling purposes. If an institution maintains separate lists of assets reviewed under IAR programs (i.e., by asset type—separate lists for commercial real estate loans, construction loans,

etc.), the examiner should combine the lists into one list for sampling purposes. An exception to this general policy is for larger institutions that have decentralized IAR programs. For example, some large, geographically diverse institutions may have separate IAR programs for different geographic regions. In such cases, the examiner should assess the IAR systems separately.

### **Systematic Sampling**

#### *Numerical Interval Sampling*

Numerical sampling is the selection of items based on their numerical order in the portfolio or list.

For thrifts with large portfolios of assets, examiners, from a random start, may select and review a statistically valid, numerical interval sample of assets. This methodology essentially entails the selection of a numeric interval (i.e., every 29th asset). From a random start on a list of assets, the examiner counts each asset and selects the assets at the interval.

After a review of the assets selected, if no exceptions are found, the examiner does not need to expand the sample. Instead, the examiner can conclude that the institution has a reliable IAR program for the purpose of including the results of the IAR program in meeting minimum examination sampling coverage standards (if the examiner is reviewing the IAR-reviewed assets for appropriate classification) or can conclude that there are no asset quality problems that result from poor underwriting standards for the asset pool under review (if the examiner is reviewing homogeneous assets).

If the review discloses 1, 2 or 3 exceptions, then the examiner should expand the sample. The process to expand the sample sizes from the initial sample size is shown in Appendix E. If there are four or more exceptions, then the IAR program does not meet the reliability standards established in this Handbook Section and the examiner cannot include the results of the IAR program in meeting the minimum examination sampling coverage standards for nonhomogeneous assets; for homogeneous assets, 4 or more exceptions means that the examiner should conclude that a significant number of assets in the pool have not been underwritten in a prudent fashion. In such cases, further sampling of the asset pool is not necessary.

As noted in Appendix E, to ensure that OTS does not inappropriately decide that an institution's IAR program does not meet the reliability standards established in this Section or that a pool of homogeneous assets have been underwritten prudently, exceptions should be reviewed by the EIC or another examiner.

The numerical interval sampling guidance provided in Appendix E will provide the examiner with a representative sample of the relevant population of assets. Such a sample will allow the examiner to draw conclusions about the entire population from which the sample was drawn, while minimizing the number of assets that must be reviewed. (Representative sampling should not be equated with random sampling. Random sampling is simply a method of selecting items for inclusion in a sample; it can be used in conjunction with either statistical or nonstatistical sampling. The sampling methodology in the Appendix relies on the numerical interval selection process rather than a random selection process.)

Examiners should also consider taking a judgmental sample of significantly large assets not included in the numerical interval sample, to ensure that the institution is adequately reviewing and classifying these assets. General instructions for judgmental sampling are provided below.

#### *Dollar-Proportional Sampling*

Proportional sampling is the selection of items based on the sum of their dollar amounts. With dollar-proportional sampling, the examiner selects the sample by using a running total of asset amounts until a cer-

tain dollar amount (or "interval") is hit. The asset that causes the running total to at least equal the interval is included in the sample. The examiner should start the "adding up" process from a random point on the asset list (as defined in Appendix A). A dollar-proportional sample will consist of all assets that either: (1) are larger than the selected dollar interval or (2) cause the running total of the list to exceed the dollar interval.

For purposes of sampling assets reviewed under an institution's IAR program, a suggested material dollar interval is 3% of GAAP equity capital. Thus, for an institution with \$100 million in GAAP equity capital, \$3 million is the "interval" that triggers the inclusion of an asset in the sample.

Example: For a thrift with GAAP equity capital of \$100 million, the dollar interval is 3%, or \$3 million. From a random start on the list of assets, the examiner should start adding the dollar amounts of the assets, moving down the list. When an asset causes the running total to meet or exceed the dollar interval (\$3 million in this example), the examiner should select that asset for review. The examiner would then "add up" asset amounts until \$3 million is reached again and include the asset that makes the running total equal or exceed \$3 million in the sample. Asset amounts may be rounded or truncated to eliminate immaterial amounts for easier adding. For example, a \$1,234,567 asset may be rounded to \$1,235,000.

The examiner should continue adding assets down the list and select the asset that causes the total to meet or exceed \$3 million. Using this example, all individual assets with a book value in excess of \$3 million will always be selected for the sample. Further, a selection of smaller assets that cause the running total to meet or exceed \$3 million will be selected to be tested.

Dollar-proportional sampling method counts dollar amounts of assets relative to the interval size rather than number of assets.

Note: This method, with some minor differences, may also be used instead of the minimum cut-off method to independently sample nonhomogenous assets.

### **Nonsystematic or Risk-Focused Sampling**

There are two types of nonsystematic or risk-focused sampling discussed in this Appendix: minimum cut-off sampling and judgmental sampling.

#### *Minimum Cut-Off Sampling*

Minimum cut-off sampling is an efficient method to analyze nonhomogeneous assets to help determine the thrift's risk of loss. This sampling method selects all assets with a balance (or commitment) equal to or greater than a cut-off amount. Exhibit 1 of this Appendix shows the basic steps to select the assets to be reviewed in minimum cut-off sampling. This sampling methodology can be used to review the underwriting standards used by an institution for its nonhomogeneous assets.

#### *Judgmental Selection*

Judgmental selection is used to: (1) sample nonhomogeneous assets that have a greater than normal probability of being adversely classified and (2) expand a systematic sample for homogeneous assets if significant subcategories of assets are not covered by the sample.

For nonhomogeneous assets, Exhibit 2 of this Appendix lists asset groups that may have greater than normal risk of material loss. When selecting assets to review for material risk of loss, the examiners' professional judgment is more important than strict adherence to general procedures and coverage standards. For this reason, judgmental sampling should be used to supplement systematic sampling.

Judgmental sampling may also be used to supplement systematic samples during the examiner's review of the institution's IAR program or of systematic sampling of the underwriting of homogeneous assets. For example, the examiner may judgmentally select assets that were not selected in a numerical interval sample of the internally reviewed assets. Also, if an asset is selected for review from a sample and the borrower has multiple credits with the institution, the examiner should use his/her judgment as to whether to include the entire set of related credits in the sample. For example, if the examiner believes that reviewing all the associated credits will enhance his/her ability to assess whether the initially selected asset is a safe and sound asset, the examiner should include the associated credits.

If a review of judgmentally selected assets reveals problems, additional judgmental sampling can help pinpoint causes and help devise solutions. For example, the examiner may determine that underwriting exceptions or adverse classifications are attributable to one branch office or a single time period. Additional sampling, concentrating on the affected assets, might disclose that the problems are attributable to a single loan officer or broker, or to substitute employees performing unfamiliar duties.

**Exhibit 1**  
**Minimum Cut-Off Sampling**

- Determine the approximate book value of the nonhomogeneous assets in the portfolio. This can be done with internal management reports or a Thrift Financial Report.
- Set a target range for the percent of that book value to be reviewed. For a portfolio with no indication of serious problems, the initial range for the minimum cut-off and judgmental samples combined would be 30% to 50% of the dollar volume of nonhomogeneous assets.
- Select a cut-off for the dollar value of the balances of assets to be reviewed. A good starting point might be 0.25% of total assets or 2.5% of the thrift's GAAP equity capital, rounded to a convenient number. Select all assets at and above the dollar cut-off in the population being sampled.
- Calculate the percentage dollar volume selected. If the percent selected is significantly different from the target percent, adjust the cut-off so that the percent selected falls within the target range. The assets selected should be reviewed and recorded on Thrift Activities Asset Review line sheets.

*Note:* Dollar-proportional sampling may be used to independently sample nonhomogeneous assets instead of the minimum cut-off method since it also selects assets with individual book values over a certain material dollar interval/amount (as well as smaller assets). This method is particularly useful for portfolios with an extreme variance in dollar amounts or that cannot be divided between homogeneous and nonhomogeneous assets.

The dollar-proportional sampling procedures for testing the underwriting of nonhomogeneous assets (the "independent sample") are similar to the dollar-proportional sampling procedures for testing the institution's IAR program. A key difference is that the dollar interval is usually not the same, since the purposes for these two examination procedures are different. For independent sampling of nonhomogeneous assets, a starting point for the material dollar interval might be 0.25% of total assets or 2.5% of the thrift's equity capital, rounded to a convenient number.

When using this technique to sample nonhomogeneous assets, the examiner should supplement the dollar-proportional procedures discussed earlier in this Appendix with the following:

- Determine the total book value of the nonhomogeneous assets in the portfolio.
- Set a target range for the percent of that book value to be reviewed.
- Select the assets using the process described earlier and determine the percentage dollar volume selected.
- If the sample is too large or too small, either decrease the sample size by eliminating some smaller assets or increase the sample size by lowering the minimum cut-off. (This is far more efficient than rerunning the dollar proportional selection.)
- When the sample is within the target range, review and record pertinent information on each sampled asset on individual Thrift Activities Asset Review line sheets.

**Exhibit 2**  
**Asset Groups with High Risk of Material Loss**

*Troubled assets, including assets:*

- With principal or interest past due for 30 days or more;
- Renewed without interest collection;
- With extended maturities or due dates;
- With significant capitalized interest;
- That are restructured troubled debts; or
- In nonaccrual status.

*Loans identified as problems, including loans:*

- Previously classified by examiners;
- Internally classified;
- On the thrift's problem list or watch list; or
- Identified in director or committee minutes, audits, or other sources, as having more than normal risk.

*Loans to borrowers in groups who present special risk, including loans to:*

- Insiders (officers, directors, stockholders);
- Insiders of other financial institutions;
- Related interests of insiders;
- Entities with classified loans elsewhere;
- Customers with overdrafts or cash items; or
- Guarantors and principals of commercial borrowers.

*Loans with collateral or repayment sources presenting special risk, including loans:*

- In specific high-risk markets (e.g., commercial construction, land speculation and development, leveraged buy-outs, new enterprises, commercial fishing, farming, extraction industries, restaurants, and dealers in mobile homes, new and used cars, home appliances, or farm implements); or
- Out-of-territory.

*Participations that are:*

- Purchased (both nonhomogeneous assets and portfolios of homogeneous loans); or
- Sold with recourse.

*Other assets with special risks, including:*

- Loans to facilitate sale of real estate owned;
- Risky concentrations of assets;
- Nonaccrual investments;
- Real estate owned or in judgment;
- Defaulted debt securities; or
- Assets not confirmed by auditors attempting positive confirmations.